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PATENT

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Claims

35. (currently amended) An isolated nucleic acid compromising a transcriptional unit for an immunogenic flavivirus antigen, wherein the transcriptional unit directs a host cell, after being incorporated therein, to synthesize the immunogenic antigen, and wherein the transcriptional unit comprises a prM signal sequence and a Kozak ribosomal binding sequence located in a position that is effective for ribosome binding.

36. (currently amended) The nucleic acid of claim 35, wherein the flavivirus ~~is selected from the group consisting of~~comprises yellow fever virus, dengue serotype 1 virus, dengue serotype 2 virus, dengue serotype 3 virus, dengue serotype 4 virus, St. Louis encephalitis virus, ~~and~~ Japanese encephalitis virus, or a mixture of two or more thereof.

37. (currently amended) The nucleic acid of claim 35, wherein the antigen is ~~selected from the group consisting of~~ a prM/M protein, an E protein, or ~~and~~ both a prM/M protein and an E protein.

38. (previously added) The nucleic acid of claim 37, wherein the antigen is both the prM/M protein and the E protein and wherein the host cell secretes subviral particles comprising the prM/M protein and the E protein.

39. (previously added) The nucleic acid of claim 35 which is DNA.

40. (previously added) The nucleic acid of claim 35, wherein the transcriptional unit further comprises a control sequence disposed appropriately such that it operably controls synthesis of the antigen.

41. (previously added) The nucleic acid of claim 40, wherein the control sequence is the cytomegalovirus immediate early promoter.

42. (previously added) The nucleic acid of claim 35, wherein the transcriptional unit further comprises a poly-A terminator.

43. (previously added) A cell comprising the nucleic acid of claim 35.

44. (currently amended) The cell of claim 43, wherein the flavivirus ~~is selected from the group consisting of~~comprises yellow fever virus, dengue serotype 1 virus, dengue serotype 2 virus, dengue serotype 3 virus, dengue serotype 4 virus, St. Louis encephalitis virus, ~~and~~ Japanese encephalitis virus, or a mixture of two or more thereof.

45. (currently amended) The cell of claim 43, wherein the flavivirus antigen is ~~selected from the group consisting of~~ a prM/M protein, an E protein, or ~~and~~ both a prM/M protein and an E protein.

46. (previously added) The cell of claim 45, wherein the antigen is both the prM/M protein and the E protein and wherein the cell secretes subviral particles comprising the prM/M protein and E protein.

47. (previously added) A composition comprising the nucleic acid of claim 35 in a pharmaceutically acceptable carrier.

48. (currently amended) The composition of claim 47, wherein the flavivirus ~~is selected from the group consisting of~~comprises ~~yellow fever virus, dengue serotype 1 virus,~~ dengue serotype 2 virus, dengue serotype 3 virus, dengue serotype 4 virus, St. Louis encephalitis virus, ~~and~~ Japanese encephalitis virus, or a mixture of two or more thereof.

49. (currently amended) The composition of claim 47, wherein the antigen is ~~selected from the group consisting of~~ a prM/M protein, an E protein, or ~~and~~ both a prM/M protein and an E protein.

50. (previously added) The composition of claim 49, wherein the antigen is both the prM/M protein and the E protein and wherein the cell secretes subviral particles comprising the prM/M protein and the E protein.

51. (previously added) The composition of claim 47, wherein the nucleic acid is DNA.

52. (previously added) The composition of claim 47, wherein the transcriptional unit further comprises a control sequence disposed appropriately such that it operably controls synthesis of the antigen.

53. (previously added) The composition of claim 52, wherein the control sequence is the cytomegalovirus immediate early promoter.

54. (previously added) The composition of claim 47, wherein the transcriptional unit further comprises a poly-A terminator.

55. (currently amended) A method of immunizing a subject against flavivirus infection ~~by a flavivirus~~ comprising administering to the subject an effective amount of the composition of claim 47.

56. (currently amended) The method of claim 55, wherein the flavivirus ~~is selected from the group consisting of~~comprises yellow fever virus, ~~dengue serotype 1 virus, dengue~~ serotype 2 virus, dengue serotype 3 virus, dengue serotype 4 virus, St. Louis encephalitis virus, ~~and~~ Japanese encephalitis virus, or a mixture of two or more thereof.

57. (currently amended) The method of claim 55, wherein the antigen is ~~chosen from the group consisting of~~ a prM/M protein, and E protein, or ~~and~~ both a prM/M protein and an E protein.

58. (currently amended) The method of claim 57, wherein the antigen is both the prM/M protein and the E protein, and wherein a cell within ~~the body of~~ the subject, after incorporating the nucleic acid within it, secretes subviral particles comprising the prM/M protein and E protein.

59. (previously added) The method of claim 55, further comprising administering the composition to the subject in a single dose.

60. (previously added) The method of claim 55, wherein the composition is administered via a parenteral route.

61. (previously added) The method of claim 55, wherein the nucleic acid is DNA.

62. (previously added) The method of claim 55, wherein the transcriptional unit further comprises a control sequence disposed appropriately such that it operably controls synthesis of the antigen.

63. (previously added) The method of claim 62, wherein the control sequence is the cytomegalovirus immediate early promoter.

64. (previously added) The method of claim 55, wherein the transcriptional unit further comprises a poly-A terminator.

65. (previously added) A polypeptide encoded by the nucleic acid of claim 35.

66. (previously added) A method of detecting a flavivirus antibody in a sample, comprising:

(a) contacting the sample with the polypeptide of claim 65 under the conditions whereby an antigen/antibody complex can form; and

(b) dctecting antigen/antibody complex formation, thereby detecting a flavivirus antibody in the sample.

67. (previously added) A method of diagnosing a flavivirus infection in a subject, comprising:

(a) contacting a sample from the subject with the polypeptide of claim 65 under conditions whereby an antigen/antibody complex can form; and

(b) detecting antigen/antibody complex formation, thereby diagnosing a flavivirus infection in the subject.

68. (new) The method of claim 55, further comprising administering the composition to the subject in more than a single dose.

69. (new) The nucleic acid of claim 35, wherein the Kozak ribosomal binding sequence is located from positions -9 to +4 in the transcriptional unit.

70. (new) An isolated subviral particle secreted from the cell of claim 46.

71. (new) A composition comprising the subviral particle of claim 70 in a pharmaceutically acceptable carrier.

72. (new) A method of immunizing a subject against flavivirus infection comprising administering to the subject an effective amount of the composition of claim 71.

73. (new) The method of claim 72, wherein the flavivirus comprises yellow fever virus, dengue serotype 1 virus, dengue serotype 2 virus, dengue serotype 3 virus, dengue serotype 4 virus, St. Louis encephalitis virus, Japanese encephalitis virus, or a mixture of two or more thereof.

74. (new) The method of claim 72, further comprising administering the composition to the subject in a single dose.

75. (new) The method of claim 72, further comprising administering the composition to the subject in more than a single dose.

76. (new) The method of claim 72, wherein the composition is administered via a parenteral route.

77. (new) A method of inducing an immunogenic response in a subject comprising administering to the subject an effective amount of the composition of claim 47, wherein the immunogenic response comprises production of antibodies to the flavivirus antigen.

78. (new) The method of claim 77, wherein the flavivirus comprises yellow fever virus, dengue serotype 1 virus, dengue serotype 2 virus, dengue serotype 3 virus, dengue serotype 4 virus, St. Louis encephalitis virus, Japanese encephalitis virus, or a mixture of two or more thereof.

79. (new) The method of claim 77, wherein the antigen is a prM/M protein, an E protein, or both a prM/M protein and an E protein.

80. (new) The method of claim 77, wherein the antigen is both the prM/M protein and the E protein, and wherein a cell within the subject, after incorporating the nucleic acid within it, secretes subviral particles comprising the prM/M protein and E protein.

81. (new) The method of claim 77, wherein the composition is administered via a parenteral route.

82. (new) The method of claim 77, wherein the nucleic acid is DNA.

83. (new) The method of claim 77, wherein the transcriptional unit further comprises a control sequence disposed appropriately such that it operably controls synthesis of the antigen.

84 (new) The method of claim 83, wherein the control sequence is the cytomegalovirus immediate early promoter.

85. (new) The method of claim 77, wherein the transcriptional unit further comprises a poly-A terminator.

86. (new) A composition comprising purified flavivirus antigen antibodies produced by the method of claim 77.